

## ABSTRACT OF THE DISCLOSURE

A physical neural network is disclosed, which includes a connection network comprising a plurality of molecular conducting connections suspended within a connection gap formed between one or more input electrodes and one or more output electrodes. One or more molecular connections of the molecular conducting connections can be strengthened or weakened according to an application of an electric field across said connection gap. Thus, a plurality of physical neurons can be formed from said molecular conducting connections of said connection network. Additionally, a gate can be located adjacent said connection gap and which comes into contact with said connection network. The gate can be connected to logic circuitry which can activate or deactivate individual physical neurons among said plurality of physical neurons.